Math 113 Take Home 1 Name: _____

Due on Tuesday June 9, 2015

Code of Academic Honesty

The work on this exam represents my own. I am allowed to use class notes and lectures. I am not allowed to get help from any other human being (classmates, other teachers, tutors, spouses, children, other family members,….).

Signature_____ Date: _____

GRADE: _____%

1. (a) Sketch the angle $-7\pi/4$ in standard position. (2 points)

(b) Find (if possible) the complement and supplement of $3\pi/4$. (2 points)

(c) Express the angle $150°$ in radian measure as a multiple of π. (2 points)

(d) The angle measure of 3 radian is _____ in degree. Round to three decimal place. (2 points)

(e) The angle measure of $85°18' 30''$ is _____ in decimal degree form. Round to three decimal place. (2 points)

2. Use the value of the trigonometric function $\sin t = \frac{4}{5}$ to evaluate the following functions. Assume t is an acute angle.(6 points)

   (a) $\sin(\pi - t)$

   (b) $\sin(\pi + t)$

   (c) $\cos(t)$

3. Given $\sec\theta = -2$, $\tan\theta > 0$. Find the exact values of $\sin\theta$ and $\cot\theta$. (8 points)

   a) $\sin\theta$

   b) $\cot\theta$

4. Use the function values $\csc\theta = \frac{\sqrt{13}}{2}$, $\sec\theta = \frac{\sqrt{13}}{3}$, and trigonometric identities, to find the following. (12 points)

   a) $\sin\theta$

   c) $\tan\theta$

   b) $\cos\theta$

   d) $\sec(90° - \theta)$

5. Evaluate the exact sine, cosine, and tangent of each angle without using a calculator. Show your work! (18 points)
   a) $225°$

   b) $-150°$

   c) $\frac{10}{3}\pi$

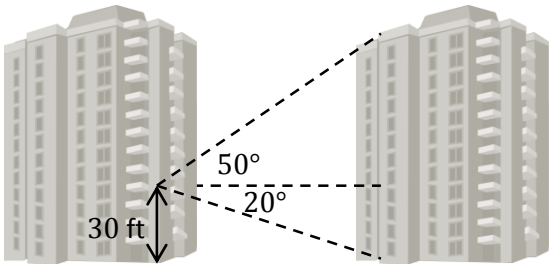
6. Find two solutions of the equation $\tan\theta = -\sqrt{3}$. Give your answer in degrees ($0° \leq \theta \leq 360°$) and radians ($0 \leq \theta \leq 2\pi$). Do not use a calculator. (6 points)

7. If $\sin\theta = 0.3$, find the exact value of $\csc\theta + \cos\left(\frac{\pi}{2} - \theta\right)$. (4 points)

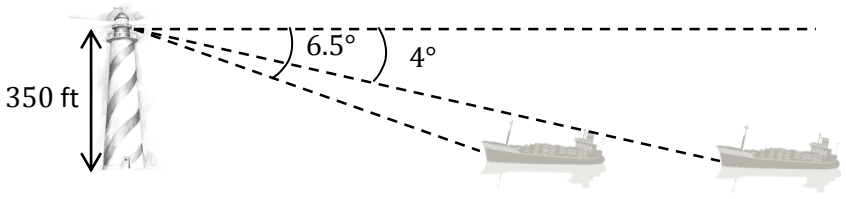
8. Find the acute angle θ that satisfies the equation $\tan\theta = \cot(\theta + 45°)$. (4 points)

9. Show that the area A of an equilateral triangle is $A = \frac{\sqrt{3}}{4}a^2$, where a is the length of one of the three equal sides and θ is the measure of one of the three equal angles. (8 points)

10. From a window 30 ft above the street, the angle of elevation to the top of the building across the street is $50°$ and the angle of depression to the base of the building is $20°$. Find the height of the building across the street. (8 points)



11. An observer in a lighthouse 350 feet above the sea level observes two ships directly offshore. The angles of depression are $4°$ and $6.5°$. How far apart are the ships? (8 points)



12. The electromotive force E, in volts, in a certain ac circuit obeys the equation $E = 120 \sin(4\pi t - 10)$, $t \geq 0$. (3 points)

    a) What is the period?

    b) What is the amplitude?

    c) What is the phase shift?

13. Sketch the graph of the Trigonometric function $y = 3 \sin(x - \pi) - 2$. Include one full period. (5 points)